



Reg. No. :

Name :

**Eighth Semester B.Tech. Degree Examination, October 2014
(2008 Scheme)**

08.816 : BIOMEDICAL ENGINEERING (T)

Time : 3 Hours

Max. Marks : 100

PART - A



Answer **all** questions.

(10×4=40 Marks)

1. With relevant figures, define absolute refractory period and relative refractory period in an action potential.
2. Write brief notes on any two types of electrodes used in ECG measurement.
3. Draw the circuit of a bioelectric amplifier.
4. How blood pressure is measured with a sphygmo manometer ?
5. Differentiate between micro and macro shock hazards.
6. What do you understand by multiple sequence alignment ?
7. Define the terms :
 - a) Tidal volume
 - b) Inspiratory reserve volume
 - c) Residual volume
 - d) Vital capacity.
8. Write notes on attenuation of ultrasound by different parts of human body, with the aid of a frequency response.
9. Discuss the merits of MRI imaging.
10. Explain a pulse modulation system used in biotelemetry.



PART – B

Answer **any two** questions from **each** Module. **All** questions carry **equal** marks.

Module – I

11. Explain synchronous and standby pacemaker, with the aid of block schematics. 10
12. a) Illustrate engineering model of electrode skin interface. 4
 b) Draw typical ECG and EEG waveforms, clearly marking the amplitude and durations. 6
13. a) Explain the principle of operation of transit time and doppler effect methods of blood flow measurement. 5
 b) Derive the expressions for velocity of blood in the two methods mentioned in a). 5

Module – II

14. a) How action potentials propagate through nerves ? 4
 b) Explain block schematic of an EEG machine. 6
15. a) Explain the importance of DNA protein sequence alignment. 5
 b) Discuss the significance of electrical safety of biomedical equipments, defining the relevant standards. 5
16. What do you understand by 'Dialysis' ? Explain the block schematic of an instrument used for dialysis. 10

Module – III

17. With a block schematic, explain a typical MRI system. 10
18. What are the three modes of scanning in ultrasound imaging ? Explain each. 10
19. a) With a schematic, explain an exciter transmitter unit for blood pressure telemetry. 5
 b) Explain the block schematic of a CT machine. 5